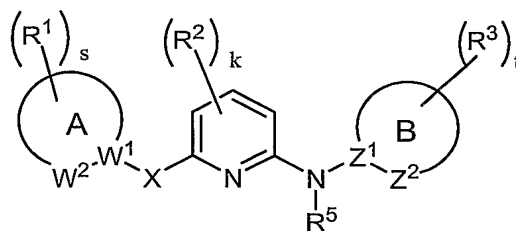


WHAT IS CLAIMED IS:

1. A compound according to Formula I:



(I)

wherein

A and B are independently substituted or unsubstituted 5- or 6- membered heterocycloalkyl, or substituted or unsubstituted 5- or 6- membered heteroaryl,

wherein

W¹ and Z¹ are independently —C— , $\text{—N}^{\oplus}\text{—}$ or —N— ;

W² and Z² are independently -NH- or -N=;

X is a bond or -NR⁴-;

s and t are independently integers from 1 to 4;

k is an integer from 1 to 3;

R¹, R², and R³ are independently H, -NO₂, -CF₃, -L¹-OR⁶, -L²-NR⁷R⁸, -L³-CONR⁷R⁸, -L⁴-COOR⁶, -L⁵-COR⁶, -L⁶-SO₂R⁶, -L⁷-SO₂NR⁷R⁸, cyano, halogen, substituted or unsubstituted alkyl, substituted or unsubstituted heteroalkyl, substituted or unsubstituted 3- to 7- membered cycloalkyl, substituted or unsubstituted 5- to 7- membered heterocycloalkyl, substituted or unsubstituted aryl, or substituted or unsubstituted heteroaryl;

R⁴ and R⁵ are independently H, substituted or unsubstituted alkyl, substituted or unsubstituted heteroalkyl, substituted or unsubstituted 3- to 7- membered cycloalkyl, substituted or unsubstituted 5- to 7- membered heterocycloalkyl, substituted or unsubstituted aryl, substituted or unsubstituted heteroaryl, -L³-CONR⁷R⁸, -L⁴-COOR⁶, -L⁵-COR⁶, -L⁶-SO₂R⁶, or -L⁷-SO₂NR⁷R⁸;

wherein

27 $L^1, L^2, L^3, L^4, L^5, L^6$, and L^7 are independently a bond, or substituted or
28 unsubstituted (C_1 - C_6) alkylene;
29 R^6 is H, substituted or unsubstituted alkyl, substituted or unsubstituted
30 heteroalkyl, substituted or unsubstituted 3- to 7- membered
31 cycloalkyl, substituted or unsubstituted 5- to 7- membered
32 heterocycloalkyl, substituted or unsubstituted aryl, or substituted or
33 unsubstituted heteroaryl; and
34 R^7 and R^8 are independently H, substituted or unsubstituted alkyl,
35 substituted or unsubstituted heteroalkyl, substituted or unsubstituted
36 3- to 7- membered cycloalkyl, substituted or unsubstituted 5- to 7-
37 membered heterocycloalkyl, substituted or unsubstituted aryl,
38 substituted or unsubstituted heteroaryl, $-COR^{81}$, or $-SO_2R^{81}$,
39 R^{81} is substituted or unsubstituted alkyl, substituted or unsubstituted
40 heteroalkyl, substituted or unsubstituted 3- to 7- membered
41 cycloalkyl, substituted or unsubstituted 5- to 7- membered
42 heterocycloalkyl, substituted or unsubstituted aryl, or substituted
43 or unsubstituted heteroaryl, wherein
44 R^7 and R^8 are optionally joined with the nitrogen to which they are
45 attached to form a substituted or unsubstituted 5- to 7-membered
46 heterocycloalkyl or substituted or unsubstituted heteroaryl;
47 wherein if s is greater than one, then each R^1 is optionally different;
48 wherein if k is greater than one, then each R^2 is optionally different;
49 wherein if t is greater than one, then each R^3 is optionally different;
50 wherein two R^1 groups are optionally joined together with the atoms to
51 which they are attached to form a substituted or unsubstituted 5- to 7-
52 membered ring;
53 wherein two R^2 groups are optionally joined together with the atoms to
54 which they are attached to form a substituted or unsubstituted 5- to 7-
55 membered ring;
56 wherein two R^3 groups are optionally joined together with the atoms to
57 which they are attached to form a substituted or unsubstituted 5- to 7-
58 membered ring;

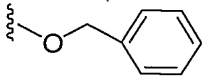
59 wherein R¹ and R² are optionally joined together with the atoms to which
 60 they are attached to form a substituted or unsubstituted 5- to 7-
 61 membered ring;
 62 wherein R² and R⁴ are optionally joined together with the atoms to which
 63 they are attached to form a substituted or unsubstituted 5- to 7-
 64 membered ring;
 65 wherein R² and R⁵ are optionally joined together with the atoms to which
 66 they are attached to form a substituted or unsubstituted 5- to 7-
 67 membered ring;
 68 wherein R² and R³ are optionally joined together with the atoms to which
 69 they are attached to form a substituted or unsubstituted 5- to 7-
 70 membered ring;
 71 wherein R¹ and X are optionally joined together with the atoms to which
 72 they are attached to form a substituted or unsubstituted 5- to 7-
 73 membered ring;
 74 wherein R² and X are optionally joined together with the atoms to which
 75 they are attached to form a substituted or unsubstituted 5- to 7-
 76 membered ring;
 77 wherein R² and R⁵ are optionally joined together with the atoms to which
 78 they are attached to form a substituted or unsubstituted 5- to 7-
 79 membered ring; and
 80 wherein R³ and R⁵ are optionally joined together with the atoms to which
 81 they are attached to form a substituted or unsubstituted 5- to 7-
 82 membered ring.

1 2. The compound of claim 1, wherein B is substituted or unsubstituted
 2 pyridinyl, substituted or unsubstituted 1,2,4-thiadiazolyl, substituted or unsubstituted
 3 pyrimidinyl, substituted or unsubstituted pyrazinyl, substituted or unsubstituted thiazolyl,
 4 substituted or unsubstituted isoxazolyl, or substituted or unsubstituted pyrazolyl.

1 3. The compound of claim 1, wherein B is substituted or unsubstituted
 2 pyridinyl.

1 4. The compound of claim 3, wherein Z¹ is $\begin{array}{c} \text{---C---} \\ || \end{array}$ and Z² is -N=.

- 1 **5.** The compound of claim 1, wherein R⁵ is H.
- 1 **6.** The compound of claim 1, wherein X is a bond.
- 1 **7.** The compound of claim 6, wherein A is substituted or unsubstituted
2 pyridinyl, substituted or unsubstituted pyrimidinyl, substituted or unsubstituted pyrazinyl,
3 substituted or unsubstituted pyridazinyl, substituted or unsubstituted thiazolyl, substituted or
4 unsubstituted isothiazolyl, substituted or unsubstituted benzimidazolyl, substituted or
5 unsubstituted imidazolyl, substituted or unsubstituted pyrazolyl, or substituted or
6 unsubstituted 1,2,4-oxadiazolyl.
- 1 **8.** The compound of claim 7, wherein A is substituted or unsubstituted
2 pyridinyl, substituted or unsubstituted pyrazinyl, substituted or unsubstituted thiazolyl, or
3 substituted or unsubstituted pyrazolyl.
- 1 **9.** The compound of claim 8, wherein A is unsubstituted pyridinyl,
2 unsubstituted pyrazinyl, unsubstituted thiazolyl, unsubstituted pyrazolyl, or unsubstituted
3 N-methyl pyrazolyl.
- 1 **10.** The compound of claim 1, wherein R¹ is H, -OR⁶, -NR⁷R⁸, -NO₂,
2 halogen, substituted or unsubstituted (C₁-C₅) alkyl, substituted or unsubstituted 2- to 5-
3 membered heteroalkyl, substituted or unsubstituted 5- to 7- membered heterocycloalkyl,
4 substituted or unsubstituted aryl, or substituted or unsubstituted heteroaryl.
- 1 **11.** The compound of claim 10, wherein R¹ is H, -NH₂, Br, F, Cl, -CF₃,
2 methyl, -OCH₃, -NH-C(O)-CH₃, -NH-C(O)-CH₂CH₃ or unsubstituted morpholino.
- 1 **12.** The compound of claim 1, wherein k is 0.
- 1 **13.** The compound of claim 1, wherein R² is -CF₃, Cl, F, -OH, -NH₂,
2 substituted or unsubstituted alkyl, or substituted or unsubstituted heteroalkyl.
- 1 **14.** The compound of claim 13, wherein R² is substituted or unsubstituted
2 (C₁-C₆) alkyl.

1 **15.** The compound of claim 13, wherein R² is -CF₃, -OCH₃, -
 2 OCH(CH₃)₂,
 3 -OCH₂CH₂OCH₃, -CH₂C(O)OCH₃, -OCH₂C(O)OCH₃, -C(O)N(CH₃)₂, -CN, -NHC(O)CH₃,
 4 or .

1 **16.** The compound of claim 1, wherein R³ is H, -OH, -NH₂, NO₂,
 2 -SO₂NH₂, halogen, substituted or unsubstituted alkyl, substituted or unsubstituted
 3 heteroalkyl, substituted or unsubstituted 5- to 7- membered cycloalkyl, substituted or
 4 unsubstituted 5- to 7- membered heterocycloalkyl, substituted or unsubstituted aryl, or
 5 substituted or unsubstituted heteroaryl.

1 **17.** The compound of claim 16, wherein R³ is substituted or unsubstituted
 2 pyrrolyl, substituted or unsubstituted thiazolyl, substituted or unsubstituted pyrrolidinonyl,
 3 substituted or unsubstituted pyridinyl, substituted or unsubstituted thiophenyl, substituted or
 4 unsubstituted furanyl, substituted or unsubstituted isoquinolinyl, or substituted or
 5 unsubstituted dihydroquinolinyl.

1 **18.** The compound of claim 16, wherein R³ is substituted or unsubstituted
 2 morpholino, substituted or unsubstituted thiomorpholino, substituted or unsubstituted
 3 pyrrolidinyl, substituted or unsubstituted pyrrolidinonyl, substituted or unsubstituted
 4 piperidinyl, substituted or unsubstituted piperazinyl, substituted or unsubstituted
 5 tetrahydrofuranyl, substituted or unsubstituted tetrahydropyranyl, substituted or
 6 unsubstituted tetrahydrothiophenyl, or substituted or unsubstituted tetrahydrothiopyranyl.

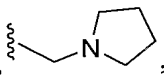
1 **19.** The compound of claim 1, wherein R³ is -L¹-OR⁶, -L²-NR⁷R⁸,
 2 -L³-CONR⁷R⁸, -L⁴-COOR⁶, or -L⁵-COR⁶,

3 wherein

4 R⁶ is H, substituted or unsubstituted (C₁-C₆) alkyl, substituted or
 5 unsubstituted 2- to 6- membered heteroalkyl, substituted or unsubstituted
 6 5- to 7- membered cycloalkyl, substituted or unsubstituted 5- to 7-
 7 membered heterocycloalkyl, substituted or unsubstituted heteroaryl, or
 8 substituted or unsubstituted aryl;

9 R^7 and R^8 are independently H, substituted or unsubstituted (C_1 - C_6) alkyl,
 10 substituted or unsubstituted 2- to 6- membered heteroalkyl, or substituted
 11 or unsubstituted heteroaryl.

1 **20.** The compound of claim 19, wherein
 2 R^6 is H, unsubstituted (C_1 - C_4) alkyl,
 3 $-CH_2CH_2N(CH_3)_2$, or unsubstituted benzyl;
 4 R^7 and R^8 are independently H, methyl, ethyl, $-C(O)CH_3$ or unsubstituted
 5 pyridinyl;
 6 wherein R^7 and R^8 are optionally joined with the nitrogen to which they
 7 are attached to form an unsubstituted pyrrolidinyl;
 8 L^1 is a bond, methylene, ethylene, or propylene;
 9 L^2 is a bond, methylene, or ethylene;
 10 L^3 is a bond;
 11 L^4 is a bond or ethylene;
 12 L^5 is a bond.

1 **21.** The compound of claim 20, wherein R^3 is $-OCH_3$,
 2 $-OCH_2CH_3$, , $-C(=O)N(CH_3)_2$, $-C(=O)OCH_3$, $-(CH_2)_2C(=O)OCH_2CH_3$, $-CH_2OH$,
 3 $-(CH_2)_2OH$, $-(CH_2)_3OH$, or $-N(CH_3)(CH_2CH_2OCH_3)$.

1 **22.** The compound of claim 1, wherein R^4 and R^5 are independently H,
 2 substituted or unsubstituted alkyl, or substituted or unsubstituted heteroalkyl.

1 **23.** The compound of claim 22, wherein R^4 and R^5 are independently H,
 2 substituted or unsubstituted (C_1 - C_6) alkyl, substituted or unsubstituted 2- to 6- membered
 3 heteroalkyl, or substituted or unsubstituted 5- to 7- membered heteroaryl.

1 **24.** The compound of claim 23, wherein R^4 and R^5 are independently H,
 2 methyl, $-C(O)OC(CH_3)_3$, $-C(O)CH_3$, or unsubstituted pyridinyl.

1 **25.** A metal complex, comprising a polyvalent metal ion and a
 2 polydentate component of a metal ion chelator, wherein said polydentate component is a
 3 compound according to claim 1.

1 **26.** The complex of claim **25**, wherein said polyvalent metal ion is from
2 iron, zinc, copper, cobalt, manganese, or nickel.

1 **27.** A method of decreasing ion flow through potassium ion channels in a
2 cell, said method comprising contacting said cell with a potassium ion channel-modulating
3 amount of a compound of one of claims **1-22**, or **33-37**, or a complex of one of claims **24** or
4 **25**.

1 **28.** The method according to claim **27**, wherein said potassium ion
2 channel comprises at least one SK subunit.

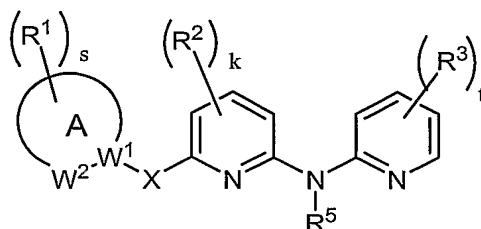
1 **29.** A method of treating a disease through modulation of a potassium ion
2 channel, said method comprising administering to a subject in need of such treatment, an
3 effective amount of a compound of one of claims **1-22**, or **33-37**, or a complex of one of
4 claims **24** or **25**.

1 **30.** The method according to claim **29**, wherein said disorder or condition
2 is selected from central or peripheral nervous system disorders, neuroprotective agents,
3 gastroesophageal reflux disorder, gastrointestinal hypomotility disorders, irritable bowel
4 syndrome, secretory diarrhea, asthma, cystic fibrosis, chronic obstructive pulmonary
5 disease, rhinorrhea, convulsions, vascular spasms, coronary artery spasms, renal disorders,
6 polycystic kidney disease, bladder spasms, urinary incontinence, bladder outflow
7 obstruction, ischemia, cerebral ischemia, ischemic heart disease, angina pectoris, coronary
8 heart disease, Reynaud's disease, intermittent claudication, Sjorgren's syndrome,
9 arrhythmia, hypertension, myotonic muscle dystrophia, xerostomi, diabetes type II,
10 hyperinsulinemia, premature labor, baldness, cancer, and immune suppression.

1 **31.** The method according to claim **30**, wherein said central or peripheral
2 nervous system disorder comprises migraine, ataxia, Parkinson's disease, bipolar disorders,
3 trigeminal neuralgia, spasticity, mood disorders, brain tumors, psychotic disorders,
4 myokymia, seizures, epilepsy, hearing and vision loss, psychosis, anxiety, depression,
5 dementia, memory and attention deficits, Alzheimer's disease, age-related memory loss,
6 learning deficiencies, anxiety, traumatic brain injury, dysmenorrhea, narcolepsy and motor
7 neuron diseases.

32. A pharmaceutical composition comprising a pharmaceutically acceptable carrier and a compound of one of claims 1-22, or 33-37, or a complex of one of claims 24 or 25.

33. The compound of claim 1, having the formula:



(II)

wherein

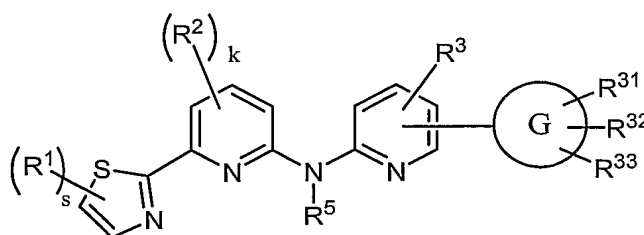
A is substituted or unsubstituted pyridinyl, substituted or unsubstituted pyrazinyl, substituted or unsubstituted thiazolyl, substituted or unsubstituted pyrimidinyl, substituted or unsubstituted imidazolyl, substituted or unsubstituted benzimidazolyl, or substituted or unsubstituted pyrazolyl,

R⁵ is H, substituted or unsubstituted alkyl, substituted or unsubstituted aryl, substituted or unsubstituted heteroaryl, -COR⁶, -COOR⁶, -CONR⁷R⁸, -SO₂R⁶, or -SO₂NR⁷R⁸; and

X is a bond.

34. The compound of claim 33, wherein A is substituted or unsubstituted thiazolyl.

35. The compound of claim 1, having the formula:



(III)

wherein

G is substituted or unsubstituted cyclopropyl, substituted or unsubstituted cyclobutyl, substituted or unsubstituted cyclopentyl, substituted or

6 unsubstituted cyclohexyl, substituted or unsubstituted cycloheptyl,
7 substituted or unsubstituted azetidiny, substituted or unsubstituted
8 pyrrolidinyl, substituted or unsubstituted piperidinyl, substituted or
9 unsubstituted azepanyl, substituted or unsubstituted piperazinyl,
10 substituted or unsubstituted morpholino, substituted or unsubstituted
11 thiomorpholino, substituted or unsubstituted tetrahydropyridinyl,
12 substituted or unsubstituted diazepanyl, substituted or unsubstituted
13 furanyl, substituted or unsubstituted thienyl, substituted or unsubstituted
14 pyrrolyl, substituted or unsubstituted thiazolyl, substituted or
15 unsubstituted oxazolyl, substituted or unsubstituted pyrazolyl, substituted
16 or unsubstituted oxadiazolyl, substituted or unsubstituted thiadiazolyl,
17 substituted or unsubstituted triazolyl, substituted or unsubstituted
18 tetrazolyl, substituted or unsubstituted phenyl, substituted or
19 unsubstituted pyridinyl, substituted or unsubstituted pyrimidinyl, or
20 substituted or unsubstituted pyrazinyl;

21 R^3 is H, substituted or unsubstituted alkyl, $-OR^6$, or halogen;

22 R^5 is H, substituted or unsubstituted alkyl, substituted or unsubstituted aryl,
23 or substituted or unsubstituted heteroaryl;

24 R^{31} and R^{32} are independently H, substituted or unsubstituted alkyl, $-OR^{311}$,
25 $-NR^{312}R^{313}$, $-COR^{311}$, $-COOR^{311}$, $-CONR^{312}R^{313}$, $-SO_2R^{311}$, -
26 $SO_2NR^{312}R^{313}$, oxo, NO_2 , cyano, imino, or halogen;

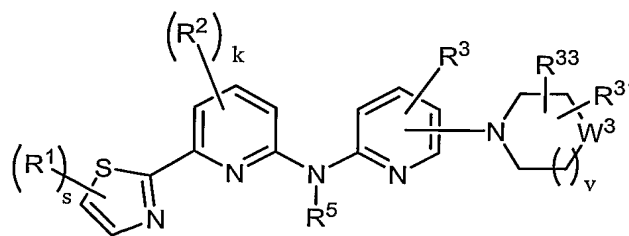
27 R^{33} is H, or substituted or unsubstituted alkyl;

28 R^{312} and R^{313} are independently H, substituted or unsubstituted alkyl,
29 substituted or unsubstituted aryl, $-COR^{314}$, or $-SO_2R^{314}$, wherein

30 R^{314} is hydrogen, substituted or unsubstituted alkyl, or substituted or
31 unsubstituted heteroalkyl; and

32 R^{311} is H, substituted or unsubstituted alkyl, or substituted or unsubstituted
33 aryl.

1 **36.** The compound of claim 1, having the formula:



(IV)

wherein

W^3 is a bond, -O-, -S-, -N(R³²)-, or -C(R³⁴R³⁵)-;

v is an integer from 0 to 2;

R^3 is H, substituted or unsubstituted alkyl, -OR⁶, or halogen;

R^5 is H, substituted or unsubstituted alkyl, substituted or unsubstituted aryl, or substituted or unsubstituted heteroaryl;

R^{31} , R^{34} , and R^{35} are independently H, substituted or unsubstituted alkyl, -OR³¹¹, -NR³¹²R³¹³, -COR³¹¹, -COOR³¹¹, -CONR³¹²R³¹³, oxo, -NO₂, cyano, imino, or halogen;

R^{32} is H, alkyl, substituted or unsubstituted heteroalkyl, substituted or unsubstituted 3- to 7- membered cycloalkyl, substituted or unsubstituted 5- to 7- membered heterocycloalkyl, substituted or unsubstituted aryl, substituted or unsubstituted heteroaryl, -OR³¹¹, -COR³¹¹, -COOR³¹¹, -CONR³¹²R³¹³, -SO₂R³¹¹, -SO₂NR³¹²R³¹³, oxo, NO₂, cyano, imino, or halogen;

R^{33} is H or substituted or unsubstituted alkyl;

R^{312} and R^{313} are independently H, substituted or unsubstituted alkyl, substituted or unsubstituted aryl, -COR³¹⁴, or -SO₂R³¹⁴, wherein R^{314} is hydrogen, substituted or unsubstituted alkyl, or substituted or unsubstituted heteroalkyl; and

R^{311} is H, substituted or unsubstituted alkyl, or substituted or unsubstituted aryl.

37. The compound of claim 1, wherein said compound is:

(6-Thiazol-2-yl-pyridin-2-yl)-(5-thiophen-3-yl-pyridin-2-yl)-amine, (3-Methoxy-6-thiazol-2-yl-pyridin-2-yl)-[5-(4-methyl-piperazin-1-yl)-pyridin-2-yl]-amine, (5,6,7,8-Tetrahydro-isoquinolin-3-yl)-(6-thiazol-2-yl-pyridin-2-yl)-amine, (3-Methoxy-6-thiazol-2-yl-pyridin-2-yl)-(3,4,5,6-tetrahydro-2H-[1,3']bipyridinyl-6'-yl)-amine, (3-Methoxy-6-thiazol-2-yl-pyridin-2-yl)-(5-morpholin-4-yl-pyridin-2-yl)-amine, (5-Pyrrolidin-

7 1-ylmethyl-pyridin-2-yl)-(6-thiazol-2-yl-pyridin-2-yl)-amine, 1-{6-[6-(5-Chloro-thiazol-2-
8 yl)-pyridin-2-ylamino]-pyridin-3-yl}-pyrrolidin-2-one, 4-Methyl-1-[6-(6-thiazol-2-yl-
9 pyridin-2-ylamino)-pyridin-3-yl]-piperazin-2-one, [6-(5-Chloro-thiazol-2-yl)-3-methoxy-
10 pyridin-2-yl]-(5-pyrrolidin-1-yl-pyridin-2-yl)-amine, [5-(1,3-Dihydro-isoindol-2-ylmethyl)-
11 pyridin-2-yl]-(6-thiazol-2-yl-pyridin-2-yl)-amine, 1-Methyl-4-[6-(6-thiazol-2-yl-pyridin-2-
12 ylamino)-pyridin-3-yl]-[1,4]diazepan-5-one, (3-Methoxy-6-thiazol-2-yl-pyridin-2-yl)-(5-
13 pyrrolidin-1-yl-pyridin-2-yl)-amine, (5-Phenyl-pyridin-2-yl)-(6-thiazol-2-yl-pyridin-2-yl)-
14 amine, (5-Bromo-pyridin-2-yl)-[6-(4-methyl-pyrazol-1-yl)-pyridin-2-yl]-amine, (5-Chloro-
15 pyridin-2-yl)-(6-pyrazin-2-yl-pyridin-2-yl)-amine, [5-(3-Fluoro-phenyl)-pyridin-2-yl]-[6-(4-
16 methyl-pyrazol-1-yl)-pyridin-2-yl]-amine, 1-[6-(6-Thiazol-2-yl-pyridin-2-ylamino)-pyridin-
17 3-yl]-piperazin-2-one, 1-[6-(3-Methoxy-6-thiazol-2-yl-pyridin-2-ylamino)-pyridin-3-yl]-
18 pyrrolidin-2-one, or [6-(5-Chloro-thiazol-2-yl)-pyridin-2-yl]-(3,4,5,6-tetrahydro-2H-
19 [1,3']bipyridinyl-6'-yl)-amine.